Figure 1

```
Ala Gln Ser Val Pro Tyr Gly Val Ser Gln Ile Lys Ala Pro Ala Leu
  1               5                  10                  15
His Ser Gln Gly Tyr Thr Gly Ser Asn Val Lys Val Ala Val Ile Asp
             20                  25                  30
Ser Gly Ile Asp Ser Ser His Pro Asp Leu Lys Val Ala Gly Gly Ala
         35                  40                  45
Ser Met Val Pro Ser Glu Thr Asn Pro Phe Gln Asp Asn Asn Ser His
     50                  55                  60
Gly Thr His Val Ala Gly Thr Val Ala Ala Leu Asn Asn Ser Ile Gly
 65                  70                  75                  80
Val Leu Gly Val Ala Pro Ser Ala Ser Leu Tyr Ala Val Lys Val Leu
                 85                  90                  95
Gly Ala Asp Gly Ser Gly Gln Tyr Ser Trp Ile Ile Asn Gly Ile Glu
            100                 105                 110
Trp Ala Ile Ala Asn Asn Met Asp Val Ile Asn Met Ser Leu Gly Gly
        115                 120                 125
Pro Ser Gly Ser Ala Ala Leu Lys Ala Ala Val Asp Lys Ala Val Ala
    130                 135                 140
Ser Gly Val Val Val Val Ala Ala Ala Gly Asn Glu Gly Thr Ser Gly
145                 150                 155                 160
Ser Ser Ser Thr Val Gly Tyr Pro Gly Lys Tyr Pro Ser Val Ile Ala
                165                 170                 175
Val Gly Ala Val Asp Ser Ser Asn Gln Arg Ala Ser Phe Ser Ser Val
            180                 185                 190
Gly Pro Glu Leu Asp Val Met Ala Pro Gly Val Ser Ile Gln Ser Thr
        195                 200                 205
Leu Pro Gly Asn Lys Tyr Gly Ala Tyr Asn Gly Thr Ser Met Ala Ser
    210                 215                 220
Pro His Val Ala Gly Ala Ala Ala Leu Ile Leu Ser Lys His Pro Asn
225                 230                 235                 240
Trp Thr Asn Thr Gln Val Arg Ser Ser Leu Glu Asn Thr Thr Thr Lys
                245                 250                 255
Leu Gly Asp Ser Phe Tyr Tyr Gly Lys Gly Leu Ile Asn Val Gln Ala
            260                 265                 270
Ala Ala Gln
        275
```

Figure 2

TABLE 1

	S149	S160	S188	S189	S190	S191	S193	S194	S196	S197	S198	S199	S201	S202
Q2K	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S3C	X	X	X	X	X	X	X	X	X	X	X	X	X	X
P5S	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S9A	X	X	X	X	X	X	X	X	X	X	X	X	X	X
I31L	X	X	X	X	X	X	X	X	X	X	X	X	X	X
K43N	X	X	X	X	X	X	X	X	X	X	X	X	X	X
M50F	X	X	X	X	X	X	X	X	X	X	X	X	X	X
A73L	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Δ75-83	X	X	X	X	X	X	X	X	X	X	X	X	X	X
E156S	X	X	X	X	X	X	X	X	X	X	X	X	X	X
G166S	X	X	X	X	X	X	X	X	X	X	X	X	X	X
G169A	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S188P	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Q206C	X	X	X	X	X	X	X	X	X	X	X	X	X	X
N212G	X	X	X	X	X	X	X	X	X	X	X	X	X	X
K217L	X	X	X	X	X	X	X	X	X	X	X	X	X	X
N218S	X	X	X	X	X	X	X	X	X	X	X	X	X	X
T254A	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Q271E	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Y104A		X	X	X	X	X	X	X	X	X	X	X	X	X
G128S		X	X	X	X	X	X	X	X	X	X	X	X	X
L126I														
S166G							X					X	X	X
N155L			X											
D32A				X									X	
D32S					X									
D32V									X			X		
D32T										X				
D32G											X			
N155Q						X								
S221A								X						X

Figure 3

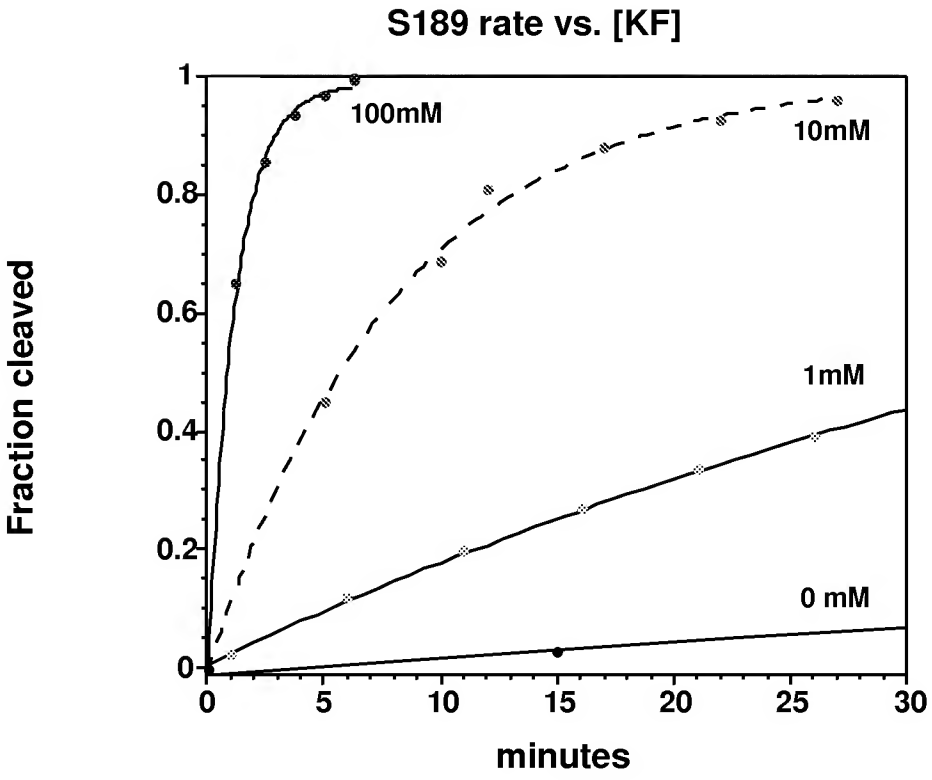

S189 rate vs. [KF]
Fraction cleaved
minutes
100mM
10mM
1mM
0 mM
0
0.2
0.4
0.6
0.8
1
0
5
10
15
20
25
30

Figure 4

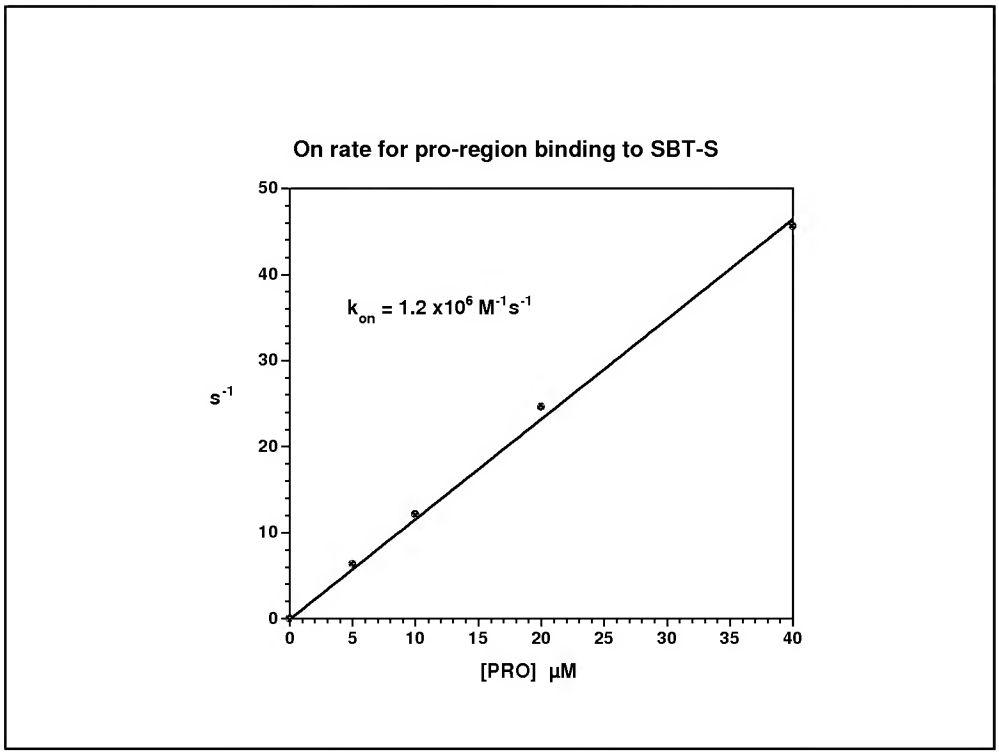

On rate for pro-region binding to SBT-S
k_{on} = 1.2 x10^6 M^{-1}s^{-1}
s^{-1}
0
10
20
30
40
50
0
5
10
15
20
25
30
35
40
[PRO] µM

Figure 5

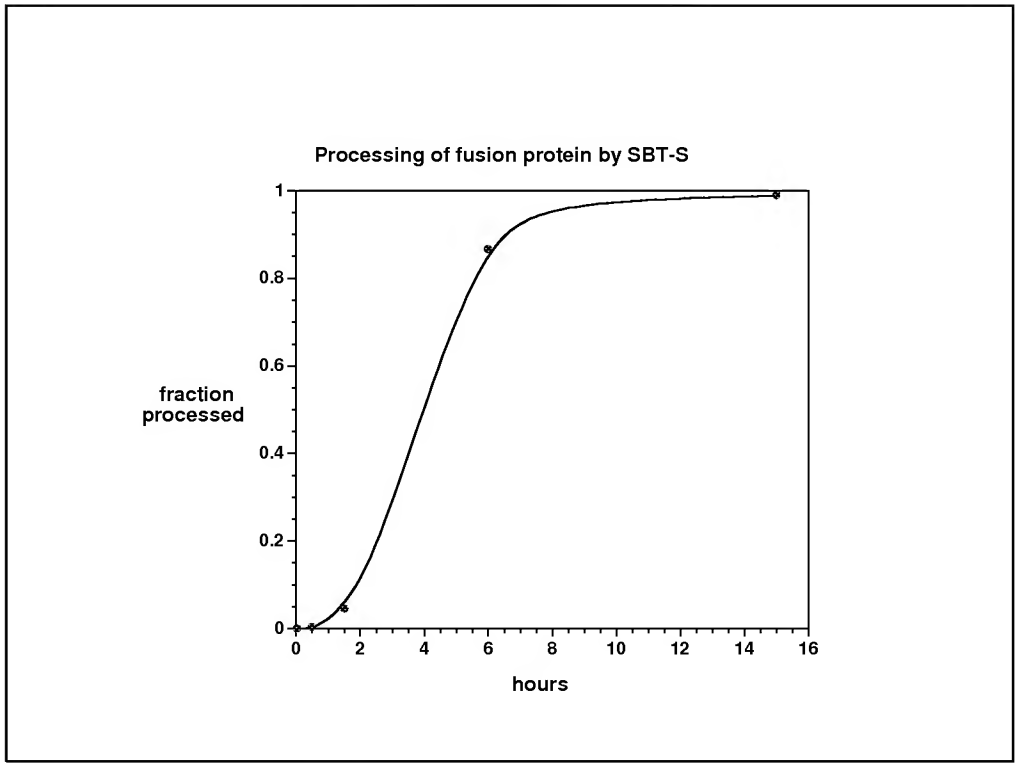

Processing of fusion protein by SBT-S
fraction processed
1
0.8
0.6
0.4
0.2
0
0
2
4
6
8
10
12
14
16
hours

Figure 6

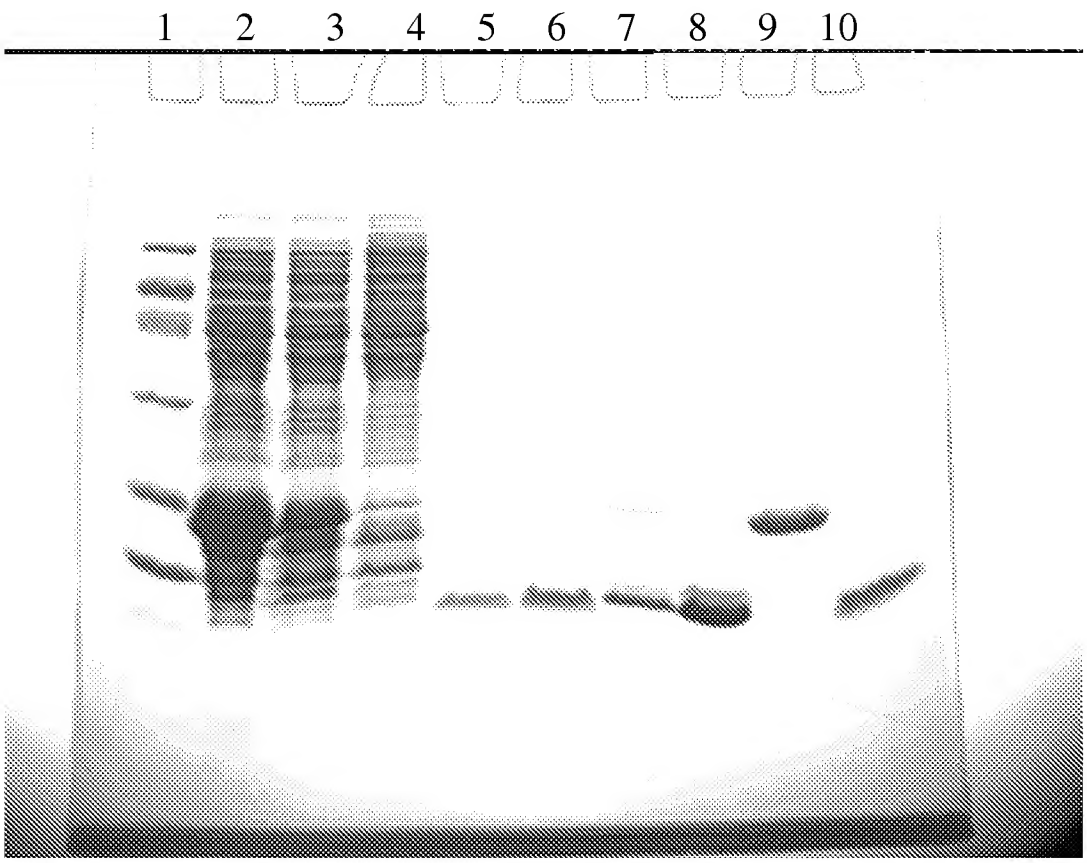


Figure 7

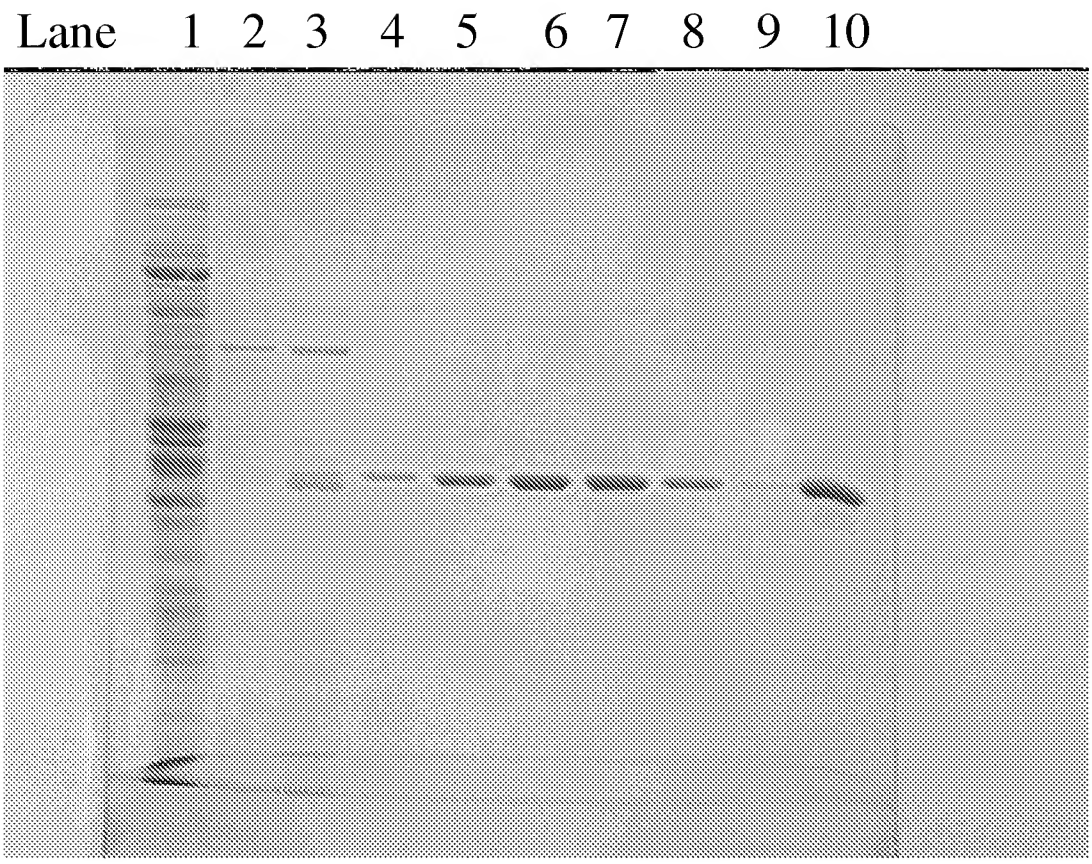
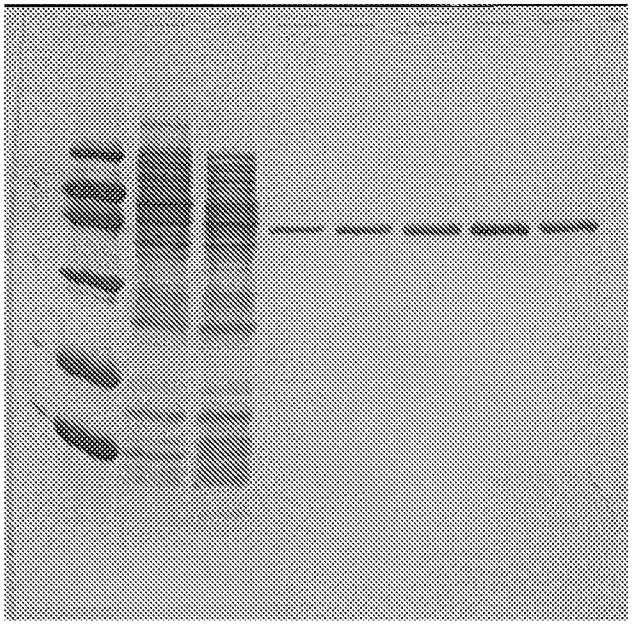


Figure 8

CDC6



DNA replication factor
379 aa

Methanothermobacter
thermautotrophicus

Figure 9

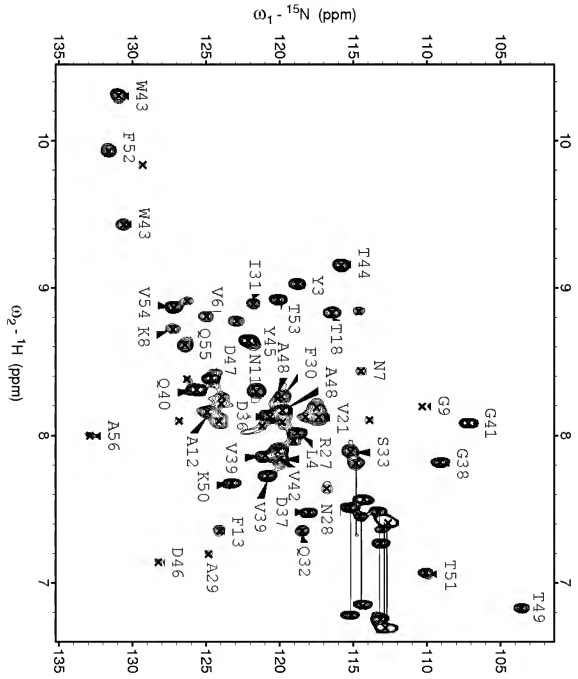


Figure 10 A

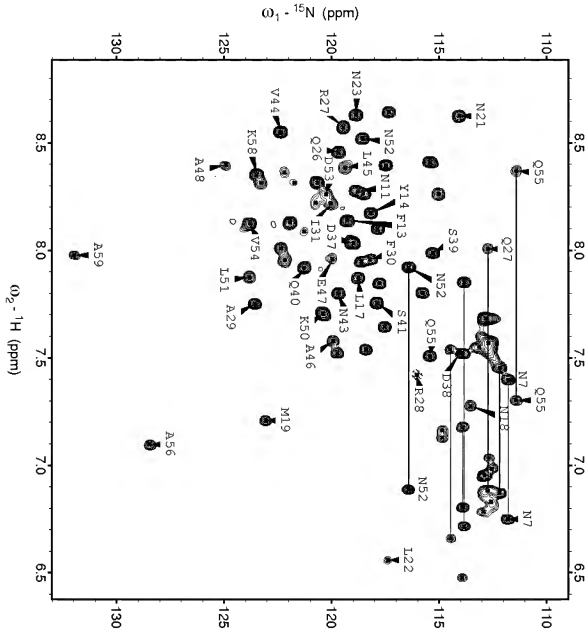


Figure 10 B

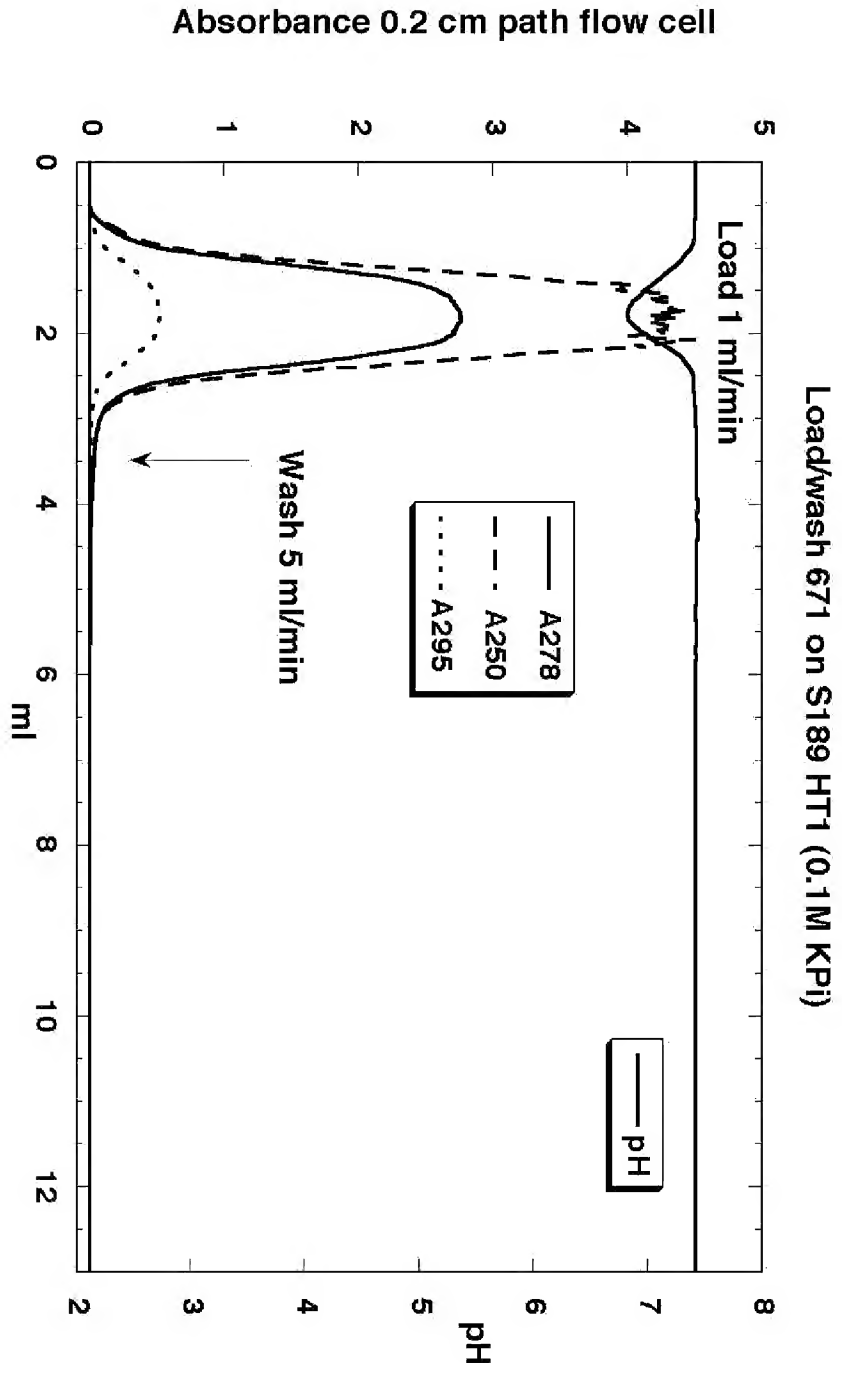

Absorbance 0.2 cm path flow cell
Load/wash 671 on S189 HT1 (0.1M KPi)
Load 1 ml/min
Wash 5 ml/min
A278
A250
A295
pH
ml
pH

Figure 11

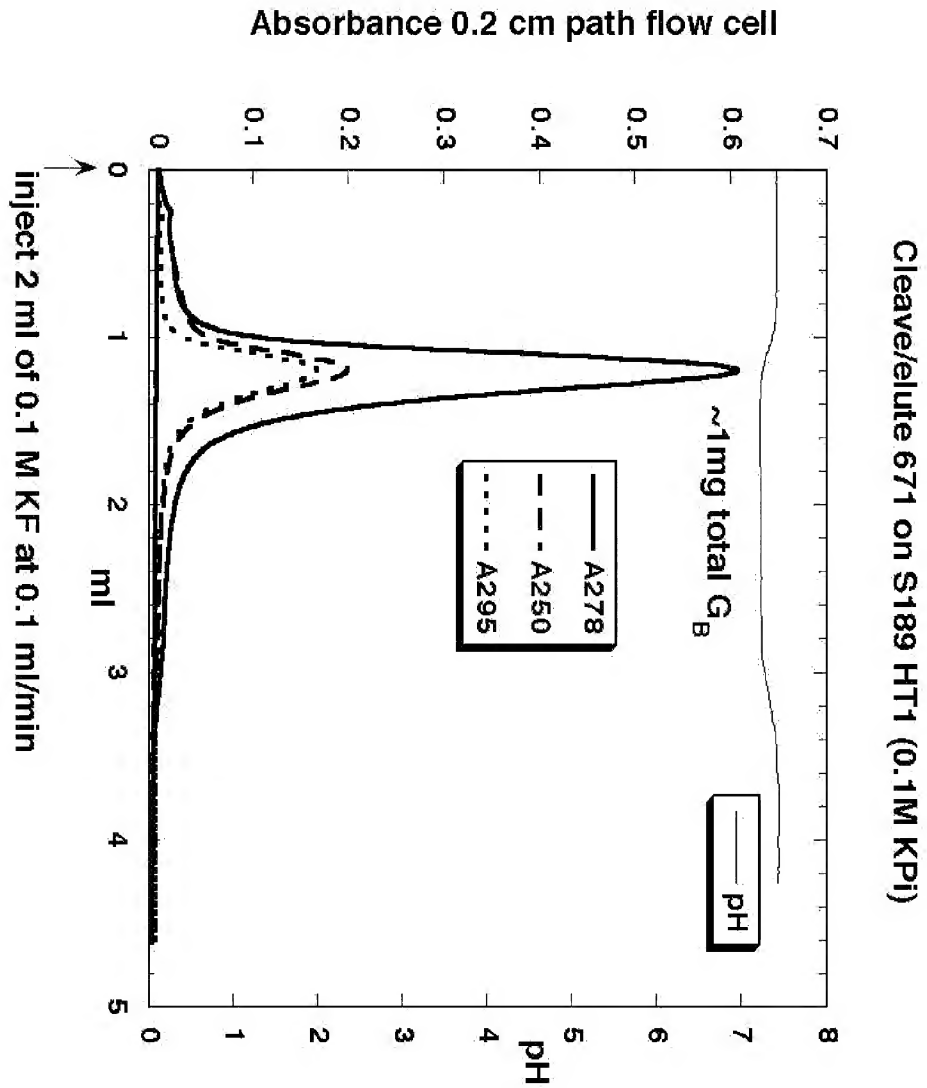

Absorbance 0.2 cm path flow cell
Cleave/elute 671 on S189 HT1 (0.1M KPi)
~1mg total G_B
A278
A250
A295
pH
inject 2 ml of 0.1 M KF at 0.1 ml/min
ml
pH
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
1
2
3
4
5
6
7
8

Figure 12

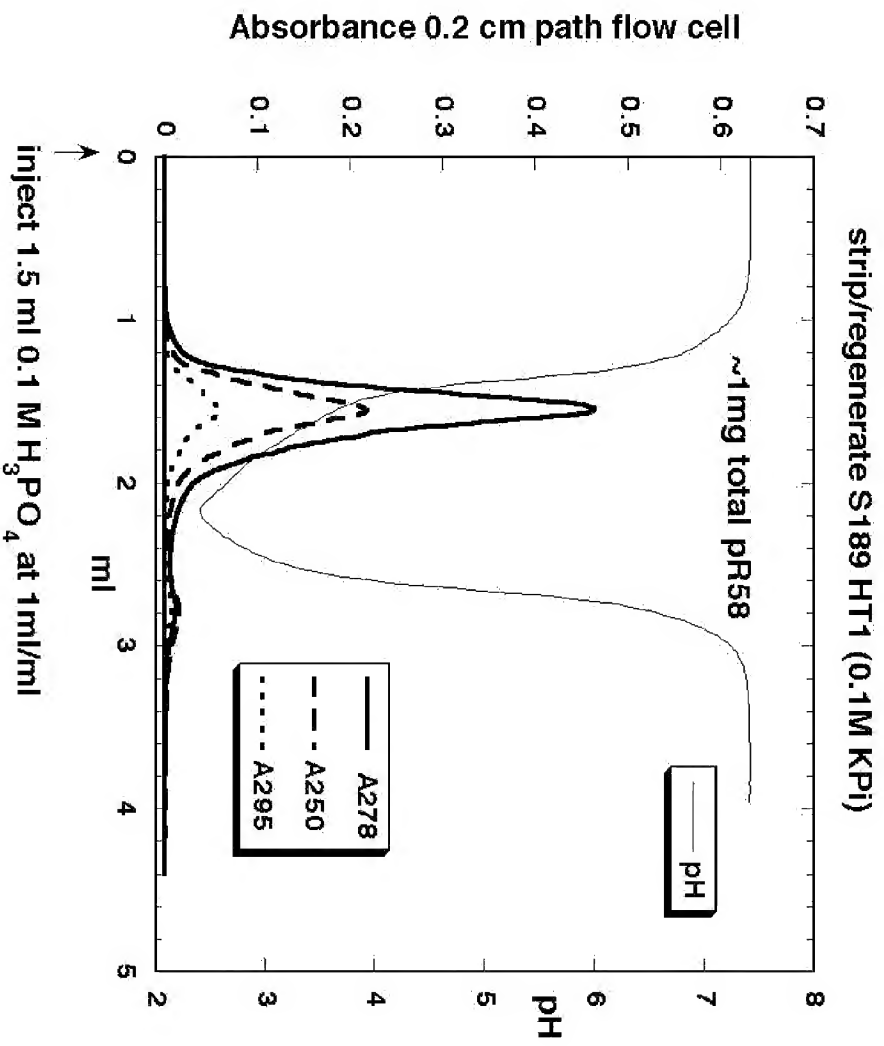

Absorbance 0.2 cm path flow cell
strip/regenerate S189 HT1 (0.1M KPi)
~1mg total pR58
pH
A278
A250
A295
inject 1.5 ml 0.1 M H_3PO_4 at 1ml/ml
ml
pH
Absorbance

Figure 13

Lane 1 2 3 4 5 6 7

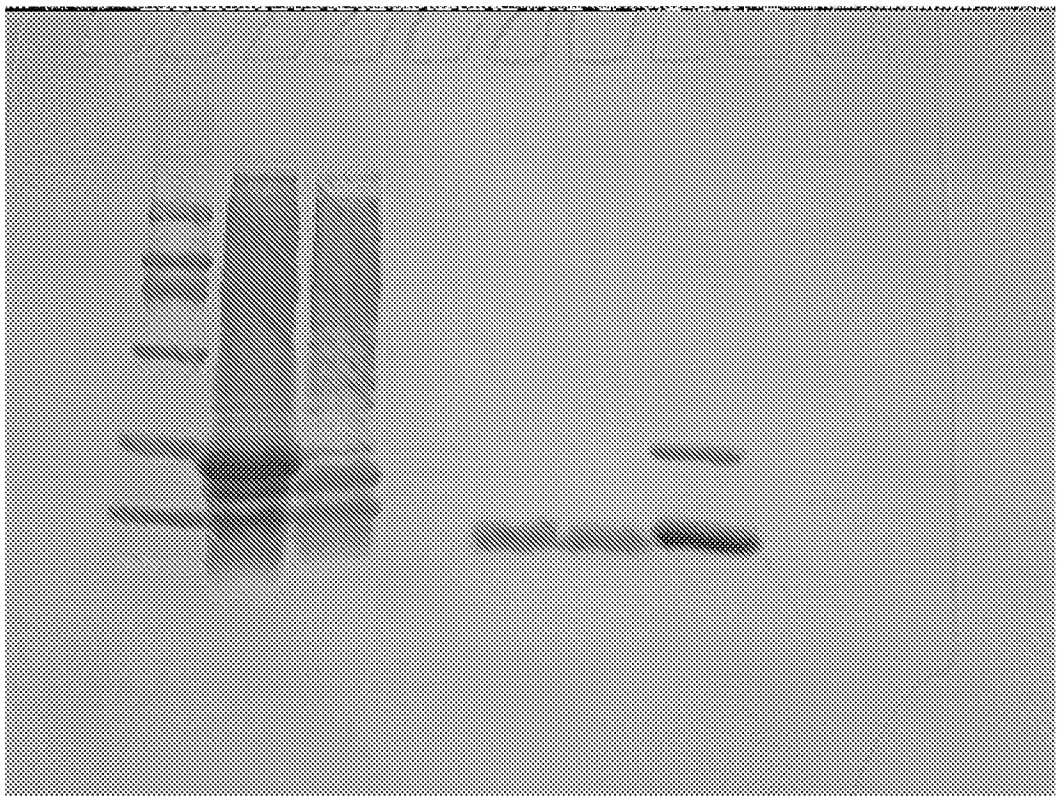


Figure 14